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(19) (CA) **CANADIAN PATENT** (12)

(54) Composite Container and Associated Carrier

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(73) Same as inventor

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ABSTRACT

A packaging system for liquids includes a relatively rigid open top carrier provided with a carrying/pouring handle, the carrier adapted to receive a collapsible container in nested relationship. The unitary, collapsible, but normally self-supporting container includes an integral dispensing portion and a screw-on type cap. The container and optional carrier are provided with cooperable surface configurations which releasably hold the container within the carrier during pouring. The container is also fully capable of stand alone use without the carrier.

COMPOSITE CONTAINER AND ASSOCIATED CARRIERFIELD OF THE INVENTION

This invention generally relates to containers for holding various materials, particularly liquid foodstuffs, for example milk, water, juice, dish and laundry detergent, as well as petroleum products such as motor oil and the like. More specifically, the present invention relates to a collapsible, disposable container and a relatively rigid reusable container carrier which is adapted to receive the collapsible container in a nested relationship, and which enables the consumer to use and then dispose of the empty container. Identical refill containers may be purchased for use alone or with the relatively permanent and reusable carrier.

BACKGROUND AND SUMMARY OF THE INVENTION

In my earlier issued U.S. Patent No. 4,805,799, novel containers are disclosed which include a substantially rigid upper container segment, a flexible bladder integral with, and depending from, the upper container segment, and a lower substantially rigid container segment attached to the upper container segment so that the flexible bladder is housed therewithin. While the containers disclosed in that patent are usable in many end-use applications, certain specialized end-use applications demand equally specialized containers.



The containers of the present invention represent improvements over the container disclosed in my earlier filed parent and related applications, and are particularly well suited for use in additional special end-use applications as described further herein.

There is great concern in government and in the food packaging industry for potential environmental hazards associated with disposable plastic containers used in the packaging and sale of beverages such as milk, water, juice, etc. and other liquids or semi-liquids (viscous liquids) such as motor oil, detergents, ketchup, etc. It has been estimated that in the dairy industry alone, as much as 500 million pounds of plastic are required each year for consumer oriented container applications, virtually all of which eventually finding its way to landfills and/or other waste sites. Significant amounts of waste plastic are also produced by the manufacture of such large amounts of plastic, thereby also contributing to the waste problem. The container assemblies of the present invention alleviate this problem to the extent of reducing the plastic required to form, for example a one-gallon container, by about fifty percent.

Moreover, and quite surprisingly, applicant has discovered that even with only approximately half the plastic content, containers made in accordance with this invention nevertheless pass the standard beverage container "drop test", by utilizing a low density polymer plastic, preferably polyethylene, in the container construction as disclosed herein.

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As a result of this discovery, raw material costs for producing one gallon plastic containers are also reduced by about fifty percent. Given the sheer volume of such containers currently produced in the U.S., it is readily apparent that substantial savings, estimated at about 50% per unit for raw material costs, can be realized by constructing containers in accordance with this invention. Similar relative savings can be expected in smaller (for example, one pint and quart) and larger (for example, five gallon) containers. In addition to reduced cost, the amount of plastic disposed of by the consumer will also be reduced by as much as about 50%, and the reduced raw material requirements will also result in reduced waste disposal at the plastics manufacturing plant.

In one exemplary embodiment of the invention, a collapsible container and carrier assembly is provided which includes an open-top, relatively rigid carrier and a relatively thin, flexible and collapsible container having an integral dispensing portion adapted to receive a conventional closure, e.g., a screw on cap. The container, which is preferably normally self-supporting (filled or empty), may be nested within the carrier.

In accordance with a preferred use of the invention, packagers in the dairy industry would fill one gallon plastic containers in accordance with this invention, ship the containers to retailers, divided proportionately (as determined by market demand) between containers nested in carriers, and stand alone containers. Additional carriers would also be supplied for separate sale,

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again as determined by consumer demand. Consumers would then purchase one or more of the relatively rigid reusable carriers and filled containers, and will thereafter purchase "refill" or "insert" plastic containers for nesting within the carriers or for use alone, as will be described further herein. The containers themselves would be collapsed and disposed of upon depletion of the liquid contents, and the collapsibility feature will result in significantly reduced volumes of waste.

It will be appreciated that the relatively rigid carriers provide protection, strength and rigidity to the overall assembly, which is particularly advantageous when the inner container is less than full, and thus more easily collapsed merely by handling. Specifically, the carrier and container shape are preferably complimentary so that good support is afforded to substantial portions of the container side and bottom walls.

It is a further advantageous feature of the invention that the container is releasably held within the carrier, so that pouring of the liquid contents is easily accomplished via use of a handle provided on the carrier, without danger of the container sliding out of the carrier.

It should be appreciated that while using the container with an associated carrier has certain benefits and advantages as described herein, the container may be used alone if desired. In other words, in the preferred embodiment, the container is normally self-supporting, but collapsible. This means that the container will stand alone both filled and empty, and the liquid contents may be

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poured from the container in a controlled fashion, particularly if the bottom of the container is held with the other hand to prevent the body of the container from collapsing during pouring.

Thus, in accordance with one aspect of the present invention, there is provided a container comprising a relatively thin, flexible stand-alone but collapsible polymer container body having a peripheral side wall, a bottom wall and a top wall, the top wall having a unitary, upstanding dispensing portion formed therein; the peripheral side wall of said container body having a thickness of between 2 and about 12 mil, the dispensing portion of said top wall having a thickness of at least about 15 mil, and wherein the container body is self-supporting both filled and empty and sufficiently strong for stand-alone use.

In accordance with another aspect of the invention, a collapsible container and carrier assembly comprises a relatively rigid plastic carrier having a substantially open upper end, a first peripheral side wall and a first bottom wall defining a first shape; a relatively thin, flexible stand-alone but collapsible polymer container body having a second peripheral side wall and a second bottom wall defining a second shape substantially complementary to the first shape; the container body also provided with a top wall, the top wall having a unitary, relatively rigid upstanding dispensing portion formed therein, the second peripheral side wall of said container body having a thickness of between 2 and about 12 mil, the dispensing portion of said top wall having a thickness of at least

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about 15 mil, wherein said container body is self-supporting both filled and empty and sufficiently strong for stand-alone use, and wherein the container body is nestable within the outer carrier so that substantially all of the first peripheral side wall and first bottom wall are in engagement with and provide support for the second peripheral side wall and second bottom wall, the carrier being provided with a handle on an exterior side thereof to facilitate pouring of contents from the container body.

In accordance with another aspect of the invention, a method of packaging and distributing liquid filled containers comprising:

- a) providing a plurality of relatively rigid and reusable carriers each having a first peripheral side wall including a handle, a first bottom wall, and an open upper end;
- b) providing a plurality of replaceable, flexible, normally self-supporting and collapsible containers each having a second peripheral side wall, a second bottom wall and top wall, formed with a dispensing portion therein, the second peripheral side wall having a thickness of between 2 and about 6 mil;
- c) filling the containers with a liquid and applying removable closures to the dispensing portions; and
- d) shipping at least some of the filled containers to retailers in a stand-alone mode without external support such that end users may utilize the containers in either a stand-alone mode or in nested relationship with the carriers, the

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carriers being reusable with other of the replaceable containers.

Thus, in accordance with the present invention, the cost of such beverage and other liquid containers can be significantly reduced, while at the same time alleviating environmental concerns by reason of a significant reduction in the amount of plastic required to manufacture such containers, and a concurrent reduction in amount and volume of plastic container waste at the consumer and manufacturing levels.

Additional objects and advantages of the variously described exemplary embodiments of the invention will become apparent after careful consideration of the detailed description which follows.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a perspective, exploded view of a container and associated carrier in accordance with the present invention; and

FIGURE 2 is a side cross sectional view of the container and carrier shown in Figure 1, but in nested relationship.

FIGURE 3 is an enlarged detail of a portion of Figure 2, but illustrating a wall thickness variation;

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FIGURES 4 and 5 are perspective views of a container in accordance with another embodiment of the invention;

FIGURES 6 and 7 are perspective views of a container in accordance with another embodiment of the invention;

FIGURE 8 is a side elevation of a container in accordance with still another embodiment of the invention; and

FIGURE 9 is a side view, partially in section, showing the container of Figure 8 in combination with an associated carrier, in a pouring orientation.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring to Figures 1 and 2, a carrier 10 is provided in the form of a pitcher, and is preferably, but not necessarily, constructed of relatively rigid plastic material. The carrier is formed with a peripheral side wall 12, a bottom wall 14, and an upper open end 16. The upper open end may be provided with an integrally formed peripheral reinforcing ring or rib 18.

The peripheral side wall 12 has a substantially square configuration, with four substantially identical sides, but it will be understood that other shapes such as round, rectangular, or polygonal could also be used.

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A handle 20 is provided on the carrier, with an upper portion 24 joined to the reinforcing ring 18 and a lower portion 22 joined to a lower portion of the side wall 12. While the handle is shown to have a somewhat modified C-shape, any handle configuration conducive to a pouring motion can be employed.

Opposed tabs 26, 28 are formed on the interior surface of the reinforcing ring and serve to hold the container within the carrier as described in more detail below.

The collapsible container 30 is unitarily formed by any suitable plastic forming process, and is preferably a low density polymer, preferably polyethylene, and includes a peripheral side wall 32, a bottom wall 34 and a top wall 36. The peripheral side wall 32 is formed with a peripheral reinforcing ring or rib 38 extending about the upper end of the side wall at the juncture with the top wall 36. The top wall 36 includes an inwardly and upwardly tapered shoulder 40 which merges with a gently tapered top wall portion 42. An upstanding dispensing portion 44 is integrally formed with the top wall and extends upwardly from a generally axially centered location of the top wall. The dispensing portion 44 includes a generally cylindrical spout 46 provided with a flanged portion 48 and an exteriorly threaded portion 50 which is adapted to receive a conventional closure, such as a screw cap 52. Other closures may be utilized as well, such as conventional valve type spouts, and the like.

A textured pattern 54 may be provided over portions of the top wall 36, if desired, including

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the shoulder portion 40 and spout 46 for decorative purposes, as is conventional in the art.

In one exemplary embodiment of the invention, a one gallon capacity container has a peripheral side wall 32 with a thickness of between about 2 and about 12 mil and preferably about 6 mil. This is contrasted with a conventional wall thickness of about 20 mil. The bottom wall 34 preferably has a thickness substantially identical to the side wall, but it may be greater if desired, as shown at 34' in Figure 3. The top wall 36 preferably has a wall thickness similar to side wall 32, but the dispensing portion 44 must be thicker to provide the necessary degree of rigidity to support the container during filling, handling, and repeated application and removal of the screw cap 52. Thus, the dispensing portion in accordance with this invention remains of a thickness similar to conventional containers, i.e., at least about 15 to about 20 mil if the depending portion is blow molded. If the dispensing portion is compression molded, thicknesses in particular areas of the dispensing portion may be as great as 90 mil.

Containers of the above described configuration and thicknesses will be collapsible but normally self-supporting, i.e., they will normally stand alone, empty or filled. It will be understood that the thickness dimensions provided above are applicable generally to one gallon and one-half gallon containers. Thickness dimensions may be increased for larger containers, for example, fifty-five gallon drums, but with substantially the

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same percent reduction in plastic required as compared to conventional containers of similar size.

Collapsible containers produced in accordance with this invention, in a conventional one gallon configuration, weigh about 30 grams, and depending on the precise wall thicknesses, slightly above (up to about 60 grams) or below. Conventional one gallon containers used in the dairy industry typically weigh between about 57 and 70 grams, the container in accordance with this invention weighing up to about 50% less than conventional containers. Similar percent reductions in weight will accrue with larger containers as well.

In use, it will be appreciated that the container 30 will nest within the carrier 10 such that the peripheral side and bottom walls 12, 14, respectively, of the carrier will provide substantially full surface support for the peripheral side and bottom walls 32, 34 of the container. In addition, and as best shown in Figure 2, tabs 26, 28 will engage the reinforcing ring 38 just above the latter's upper edge to thereby hold the container 30 within the carrier 10 during pouring.

In an alternative use of the container 30, it is possible to handle and pour the contents from the container without the carrier 10. In other words, while the carrier has beneficial features which enhance the user's ability to pour the liquid contents from the container, the carrier is not necessarily required for the container 30 to function. Thus, user or consumer may pour the contents from container 30, although two hands may

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be required to provide support, i.e., one hand at the neck 44, and the other near the lower end of the side wall 32 and/or bottom wall 34. To facilitate use of the container alone, an integral, flexible gripping tab (not shown) may be integrally formed near the bottom wall 34. The flexibility of the tab would permit the latter to fold against the side wall 32 upon insertion into the carrier 10 so as not to interfere with the nested relationship of the carrier and container.

In another and preferred aspect of the invention, a method of packaging and distributing liquids includes the steps of:

- a) providing a relatively rigid and reusable carrier 10 having a first peripheral side wall 12 including a handle 20, a first bottom wall 14, and an open upper end 16;
- b) providing a flexible, normally self-supporting and collapsible container 30 having a second peripheral side wall 32, a second bottom wall 34 and top wall 36 formed with a dispensing portion 44 thereon;
- c) filling the container 30 with a liquid and applying a removable closure 52 to the dispensing portion 44; and
- d) shipping at least some of the filled containers to retailers in a stand-alone mode without external support such that end users may utilize the containers in either a stand-alone mode or in nested relationship with the carriers, the carriers being reusable with other of the replaceable containers.

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Referring now to Figures 4 and 5, a second exemplary embodiment of the invention is illustrated which includes a thin walled, flexible and collapsible but stand-alone container adapted particularly for use with petroleum products such as motor oil. The container includes a peripheral side wall 62, a substantially flat bottom wall 64, a tapered shoulder portion 66 extending from the upper end of the peripheral side wall 62, and a dispensing portion 68. The dispensing portion 68 includes an expandable/contractible bellows portion 70 (which may be of the pop-out/pop-in type), a radially outwardly extending flange 72, and a threaded upper end enclosed by a removable screw cap 74.

A recess 76 is provided in the tapered shoulder section 66 as well as in the upper end of the peripheral side wall 62. This recess includes a substantially vertical wall 78, a portion of which has a radius of curvature at its inwardmost portion which corresponds substantially to the curvature of the dispensing portion 68. The recess 76 also includes a substantially flat bottom wall 80 as well as a groove 82 extending about the vertical wall 78. At the entrance to the recess, there are provided a pair of substantially vertical ribs 84.

For shipment and inventory purposes, the dispensing portion 68 may be bent over through an angle of substantially 180° and secured within the recess 76 as shown in Figure 4. In doing so, it will be appreciated that the groove 82 in the vertical wall 78 will receive the radial flange 72 of the dispensing portion 68 while the removable

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screw cap 74 is snapped in place behind the vertical ribs 84.

The container as described above is particularly advantageous not only in that the profile the container can be reduced for shipment and/or storage, but also in that the dispensing portion 68 can be expanded vertically to the extent permitted by the bellows portion 70, thereby facilitating pouring of the oil from the container into, for example, a filler hole of a vehicle engine which is sometimes difficult to access with conventional oil containers.

After emptying the container of its contents, the dispensing portion 68 may again be tucked into the recess 76 and the remainder of the container easily collapsed in a random fashion to substantially reduce post consumer waste volumes.

It will be appreciated that the above described container has substantially the same differentiated wall thicknesses as described above in connection with the embodiment illustrated in Figures 1 and 2. In this instance, the thicker wall portion will commence in the tapered shoulder 66 and extend through the dispensing portion 68. It will also be appreciated that the container as described is also unitarily formed by any suitable plastic forming process (such as blow molding) and is preferably a low density polymer such as polyethylene.

A variation of the embodiment illustrated in Figures 4 and 5 is shown in Figures 6 and 7. For convenience, similar reference numerals as used in Figures 4 and 5 are used in Figures 6 and 7 to designate common components, but with the prefix 1

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added. Thus, the container 160 includes a peripheral side wall 162, a substantially flat bottom wall 164, a tapered shoulder section 166 and an upstanding dispensing portion 168. The dispensing portion 168 includes an expandable/contractible bellows portion 170, a radially outwardly extending flange 172 and an upper threaded end closed by a removable screw cap 174.

A recess 176 is provided in the container in an area which overlaps the tapered shoulder section 166 and the upper end of the peripheral side wall 162. Unlike the recess 76 in the embodiment illustrated in Figures 4 and 5, recess 176 has a fairly shallow configuration, defined by a wall 178 which has a radius of curvature at its innermost end substantially similar to the curvature of the upstanding dispensing portion 168. The entrance to the recess 176 (substantially at the interface of tapered shoulder section 166 and peripheral side wall 162) is provided with a pair of outstanding lugs or ribs 182. For shipment/storage (as well as disposal) purposes, the dispensing portion 168 may be folded over and snapped into the recess 176 behind the lugs 182. The manner of use and the disposal procedures are otherwise similar to the embodiment illustrated in Figures 4 and 5.

It will be appreciated that variations of the above described containers are possible which nevertheless remain within the scope of this invention. For example, the manner in which the dispensing portions 68 or 168 are held within recesses 76 or 176 may merely include a friction fit or the use of cooperating ribs, detents, etc. In

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addition, the degree of expansion/contraction of the bellows portion of the dispensing portion 68 or 168 may also be varied to suit particular applications. It will further be appreciated that the size and shape of the containers may also be varied so long as the features of the invention, i.e., the reduction in plastic required to form the container, its flexibility, collapsibility, and capability for stand-alone use, are retained.

The containers illustrated in Figures 4 through 9 are fully capable of stand-alone use, i.e., no external rigid supporting carrier is required. It will be appreciated, however, that the container may be used with a relatively rigid outer carrier or funnel if so desired, particularly to facilitate pouring.

Turning now to Figures 8 and 9, another variation of the subject invention is disclosed, also particularly suitable for use with petroleum products such as motor oil. In this embodiment (reference numerals similar to those used in Figures 4, 5, 6 and 7 are utilized to designate common components, but with the prefix 2 added), the container 260 includes a peripheral side wall 262, a substantially flat bottom wall 264, a tapered shoulder portion 266 extending from the upper end of the peripheral side wall 262, and a dispensing portion 268. The dispensing portion 268 is provided with a radially outwardly extending flange 272 and a threaded upper end 273 enclosed by a removable screw cap (not shown). As will be appreciated from Figure 8, this embodiment is generally similar to the embodiments illustrated in Figures 4 through 7 but

does not include an expandable/contractible bellows portion in the upstanding dispensing portion, and does not include a recess for receiving the upstanding dispensing portion for shipment and/or storage. Otherwise, the container is similar in terms of both wall thickness dimensions, material, etc.

In order to facilitate pouring of the liquid contents of the container, for example motor oil, into the filler tube of a vehicle engine, a relatively rigid container carrier or funnel 300 is provided as shown in Figure 9. The funnel comprises a container supporting device, open at either end and adapted to support a container in a pouring orientation. The funnel includes a relatively smaller diameter discharge portion 302 and a relatively larger container supporting portion 304. The discharge portion 302 is small enough to be received within a filler tube 306 of a vehicle engine (not shown). The container supporting portion 304 supports the container along its entire length and about a substantial portion of the periphery of the container. In the embodiment illustrated in Figure 9, the container supporting portion 304 surrounds the container through more than 180° of the container periphery, although it should be understood that the extent of peripheral support may vary. The remaining peripheral portion of the funnel is substantially open to allow easy insertion and removal of the container from the funnel.

In order to provide additional support for the container, an interior shoulder 308 is provided

within the funnel in a transitional area between the discharge portion 302 and the container supporting portion 304. The shoulder 308 is provided with a circular opening 310 sized to permit insertion of the threaded portion 273 of the container but to engage the annular flange 272, thus serving not only to limit the extent of insertion of the container within the funnel, but also to provide stability and support for the dispensing portion 268 of the container. This arrangement prevents wedging of the dispensing portion 268 within the discharge portion 302 of the funnel which might otherwise interfere with the free flow of liquid from the container.

Additional support for the container is provided for at least a part of the tapered shoulder portion 266 of the container by the a supporting "shelf" 312 integrally formed in the funnel between container supporting portion 304 and discharge portion 302. The supporting portion 304 and shelf 312 are configured to substantially match the angular relationship between the side wall 262 and tapered shoulder 266 of the container to provide maximum support without othewrwise disturbing the shape of the thin walled container.

It will be appreciated that the carrier or funnel 300 eliminates any difficulty which might otherwise be encountered in attempting to pour the contents of the container into a relatively small filler tube without undesirable spillage.

While the invention has been described in connection with what is presently considered to be the most practical and preferred embodiments, it is to be understood that the invention is not to be

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limited thereto, but on the contrary, is intended to cover various modifications and equivalent arrangements for dispensing other products which are included within the spirit and scope of the appended claims.

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THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A collapsible container and carrier assembly comprising:

a relatively rigid plastic carrier having a substantially open upper end, a first peripheral side wall and a first bottom wall defining a first shape; a relatively thin, flexible stand-alone but collapsible polymer container body having a second peripheral sidewall and a second bottom wall defining a second shape substantially complementary to said first shape; said container body also provided with a top wall, said top wall having a unitary, relatively rigid upstanding dispensing portion formed therein, said second peripheral sidewall of said container body having a thickness of between 2 and about 12 mil, said dispensing portion of said top wall having a thickness of at least about 15 mil, wherein said container body is self-supporting both filled and empty and sufficiently strong for stand-alone use, and wherein said container body is nestable within said outer carrier so that substantially all of said first peripheral side wall and first bottom wall are in engagement with and provide support for said second peripheral side wall and second bottom wall, said carrier being provided with a handle on an exterior side thereof to facilitate pouring of contents from said container body.

2. The assembly according to claim 20 wherein the wall thickness of said second peripheral side wall is about 6 mil.

3. The assembly according to claim 20 wherein said container body has a volumetric capacity of about one gallon, and a weight of between about 30 and about 60 grams.



4. The assembly according to claim 20 wherein said container body is formed with an outwardly projecting ring about at least a part of said second peripheral sidewall, and said carrier is provided with lug means on an interior side of said first peripheral side wall, said ring and said lug means cooperable to retain said container body nested within said carrier during pouring.

5. The assembly according to claim 20 wherein said second peripheral side wall, said second bottom wall and at least a portion of said top wall have substantially identical thicknesses.

6. The assembly according to claim 20 wherein said second bottom wall has a thickness at least equal to said second peripheral side wall.

7. The assembly according to claim 20 wherein said second bottom wall has a thickness greater than said second peripheral side wall.

8. The assembly according to claim 20 wherein said dispensing portion comprises a thickened upstanding neck adapted to receive a removable closure for resealing the container.

9. The assembly according to claim 27 wherein said upstanding neck has a wall thickness greater than the wall thickness of a remaining portion of said top wall.

10. The assembly according to claim 20 wherein said polymer is a low density plastic material.

11. The assembly according to claim 20 wherein said polymer is polyethylene.

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12. A process for packaging and distributing liquid filled containers comprising:

- a) providing a plurality of relatively rigid and reusable carriers each having a first peripheral side wall including a handle, a first bottom wall, and an open upper end;
- b) providing a plurality of replaceable, flexible, normally self-supporting and collapsible containers each having a second peripheral side wall, a second bottom wall and top wall formed with a dispensing portion therein, the second peripheral sidewall having a thickness of between 2 and about 6 mil;
- c) filling said containers with a liquid and applying removable closures to said dispensing portions; and
- d) shipping at least some of said filled containers to retailers in a stand-alone mode without external support such that end users may utilize said containers in either a stand-alone mode or in nested relationship with said carriers, said carriers being reusable with other of said replaceable containers.

13. The process according to claim 31 wherein said thickness is about 6 mil.

14. The process according to claim 31 and further comprising when said container is empty, removing said empty container from said carrier, and replacing the empty container with a substantially identical filled container.

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15. The process according to claim 31 wherein said liquid is milk.

16. The process according to claim 31 wherein said liquid is water.

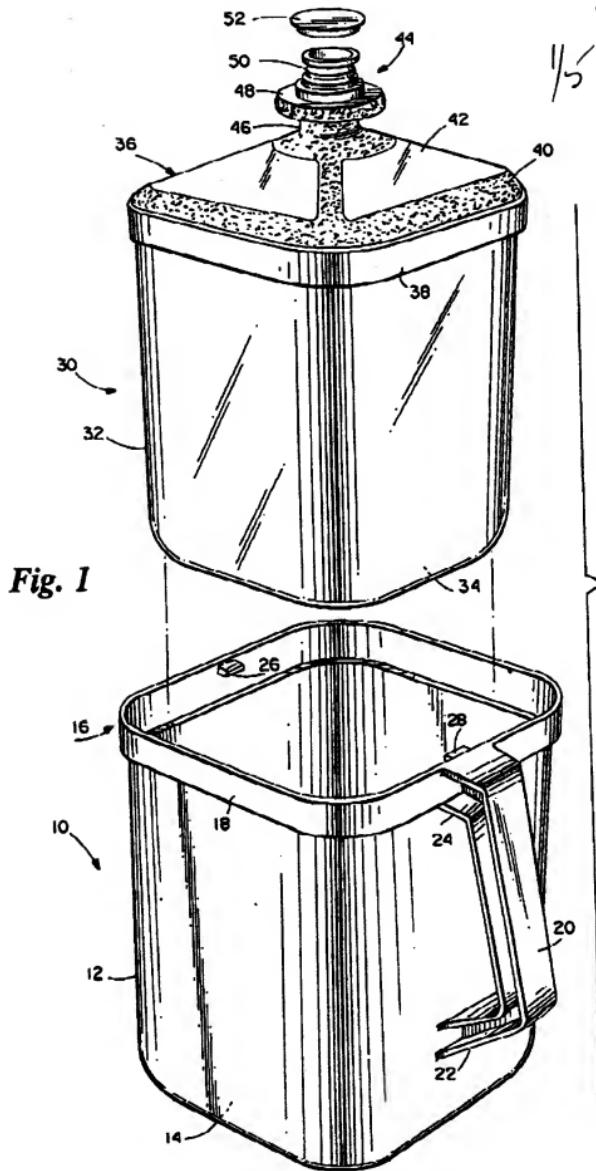
17. The process according to claim 31 wherein said liquid is detergent.

18. The process according to claim 31 wherein said liquid is a viscous or semi-liquid material.

19. The process according to claim 31 wherein, during the practice of step d), others of said filled containers are shipped in nested relationship with respective of said carriers.



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Fig. 3

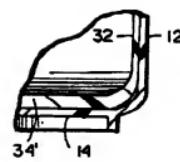
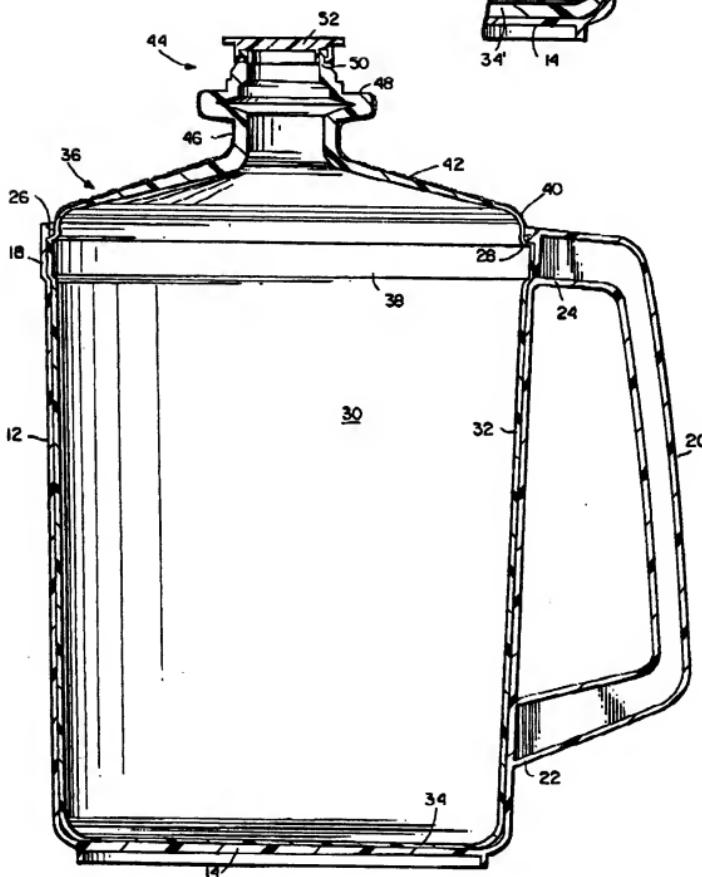
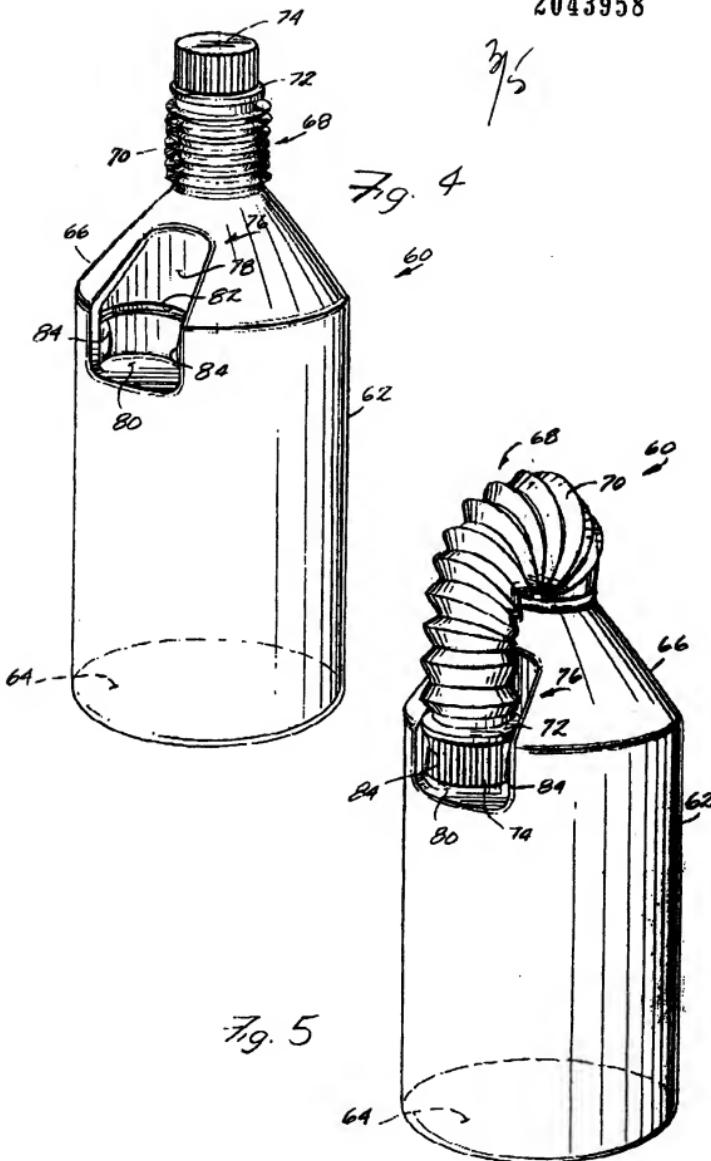


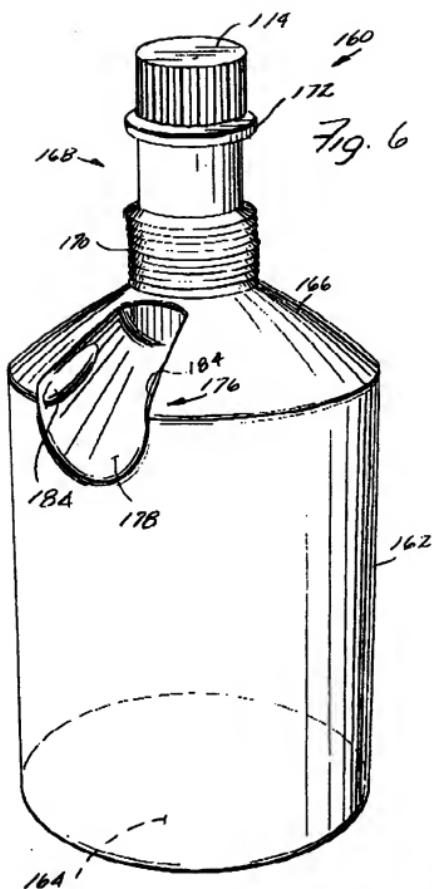
Fig. 2



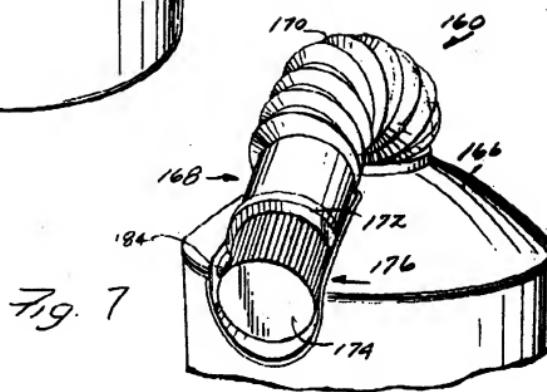
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